CLAIMS

What is claimed is:

5   1. A method of isolating sources of variance
in parametric data comprising steps of:
          (a) cleaning a data set of measurements for a
plurality of parameters;
          (b) generating a principal component analysis basis
10   from the cleaned data set;
          (c) estimating an independent component analysis
model from the principal component analysis basis;
          (d) calculating percentages of variance for the
plurality of parameters explained by each component in
15   the estimated independent component analysis model;
          (e) if the calculated percentages of variance
indicate that a component is a minor component, then
transferring control to step (f), else transferring
control to step (g);
20   (f) removing the minor component from the principal
component analysis basis and transferring control to step
(c); and
          (g) generating as output the estimated independent
component analysis model wherein no component of the
25   independent component analysis model is a minor
component.

          2. The method of Claim 1 wherein the
calculated percentages of variance indicate that a

component is insignificant if a percentage of variance for each of the plurality of parameters explained by the component is less than a minimum percentage of variance for a single parameter.

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3. The method of Claim 1 wherein the calculated percentages of variance indicate that a component is insignificant if an average percentage of variance for the plurality of parameters explained by the 10 component is less than a minimum average percentage of variance.

4. The method of Claim 1 further comprising a step (h) of calculating confidence intervals for rotation 15 angles of the estimated independent component analysis model.

5. The method of Claim 4 further comprising a step (i) of labeling a component of the estimated 20 independent component analysis model to correspond to a specific process.

6. The method of Claim 5 wherein the component is labeled as one of critical dimension of gate width 25 effect on device drive current, critical dimension of gate width effect on device threshold voltage, critical dimension of gate length effect, implant dose effect, and gate oxide thickness effect.

7. The method of Claim 5 further comprising a step (j) of examining the labeled component to identify a corresponding physical mechanism associated with the specific process.

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8. A computer program product for isolating sources of variance in parametric data comprising:

a medium for embodying a computer program for input to a computer; and

10   a computer program embodied in the medium for causing the computer to perform steps of:

(a) cleaning a data set of measurements for a plurality of parameters;

(b) generating a principal component analysis basis

15   from the cleaned data set;

(c) estimating an independent component analysis model from the principal component analysis basis;

(d) calculating percentages of variance for the plurality of parameters explained by each component in

20   the estimated independent component analysis model;

(e) if the calculated percentages of variance indicate that a component is a minor component, then transferring control to step (f), else transferring control to step (g);

25   (f) removing the minor component from the principal component analysis basis and transferring control to step (c); and

(g) generating as output the estimated independent component analysis model wherein no component of the

independent component analysis model is a minor component.

9. The computer program product of Claim 8 wherein the calculated percentages of variance indicate that a component is insignificant if a percentage of variance for each of the plurality of parameters explained by the component is less than a minimum percentage of variance for a single parameter.

10. The computer program product of Claim 8 wherein the calculated percentages of variance indicate that a component is insignificant if an average percentage of variance for the plurality of parameters explained by the component is less than a minimum average percentage of variance.

11. The computer program product of Claim 8 further comprising a step (h) of calculating confidence intervals for rotation angles of the estimated independent component analysis model.

12. The computer program product of Claim 11 further comprising a step (i) of labeling a component of the estimated independent component analysis model to correspond to a specific process.

13. The computer program product of Claim 12 wherein the component is labeled as one of critical

dimension of gate width effect on device drive current,
critical dimension of gate width effect on device
threshold voltage, critical dimension of gate length
effect, implant dose effect, and gate oxide thickness

5   effect.

     14. The computer program product of Claim 12
further comprising a step (j) of examining the labeled
component to identify a corresponding physical mechanism

10   associated with the specific process.